



Ricin Fact Sheet For Medical Providers

Ricin is a potent biological toxin that is derived from castor beans. Its mechanism of action in the body is inhibition of protein synthesis. Clinical manifestations are dependent on the dose and route of exposure. Symptoms generally appear after several hours. Ingestion of ricin typically leads to profuse vomiting and diarrhea followed by multisystem organ failure and possibly death within 36 to 72 hours of exposure. Inhalation of ricin typically leads to respiratory distress, fever, and cough followed by the development of pulmonary edema, hypotension, respiratory failure, and possibly death within 36 to 72 hours.

The dose and route of the exposure to ricin and the premorbid condition of the person exposed will contribute to the time of onset and the severity of illness. For example, the inhalation of ricin would be expected to lead to a quicker onset of poisoning and to cause a more rapid progression of poisoning compared with the ingestion of ricin, given the same exposure amount.

No commercially available antidote or vaccine exists for ricin. Ricin poisoning is treated by giving the victim supportive medical care to minimize the effects of the poisoning. The types of supportive medical care would depend on several factors, such as the route by which the victim was poisoned (that is, by inhalation, ingestion, or injection). Care could include such measures as helping the victim breathe and giving him or her intravenous fluids and medications to treat swelling. Exposed patients are not contagious.

The following is a more comprehensive list of signs and symptoms that may be encountered in a person exposed to ricin. Also, partial presentations (an absence of some of the following signs/symptoms) do not necessarily imply less severe disease.

General

- Weakness
- Malaise
- Fatigue
- Fever

Gastrointestinal signs and symptoms

- Nausea
- Vomiting

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- Abdominal pain
- Liver injury

Central nervous system signs and symptoms

- Headache
- Lethargy
- Convulsions
- Coma
- Peripheral neuropathy (1–3 weeks after acute exposure)
- Neuropsychological symptoms (several days after exposure): memory loss, restlessness, confusion

Cardiovascular signs

- Tachycardia
- Hypotension
- ECG changes (repolarization, S-T segment, and T-wave changes)

Respiratory signs and symptoms

- Tachypnea
- Dyspnea
- Pulmonary edema

Genitourinary signs

- Hemoglobinuria
- Oligouria
- Renal failure

Laboratory findings

- Anemia
- Elevated bilirubin (indirect)
- Hyperkalemia
- Damaged red blood cells (basophilic stippling, anisocytosis, Heinz-Ehrlich bodies)
- Low haptoglobin
- Elevated plasma-free hemoglobin levels
- Elevated urinary hemoglobin
- Elevated BUN and creatinine
- Abnormal liver function tests
- Thrombocytopenia
- Elevated blood or spot urine arsenic level

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Note: The actual clinical manifestations of a ricin exposure may be more variable than the syndrome described above.

Differential diagnosis:

Inhalation:

Staphylococcal enterotoxin B

Exposure to pyrolysis by-products of organofluorines (Teflon, Kevlar), or other organohalides

Oxides of nitrogen

Phosgene

Ingestion:

Enteric pathogens

Mushrooms

Caustics

Iron

Arsenic

Colchicine

Decontamination:

- Precautions for health care workers: Ricin is non-volatile, and secondary aerosols are not expected to be a danger to health care providers. Decontaminate exposed skin with soap and water.
- Environmental Clean-up: Cleanse surfaces with Hypochlorite solutions (0.1% sodium hypochlorite)
- It is recommended to double-glove when handling samples.

Suspected exposures to ricin should be reported to your local FBI and your local health department. The FBI can approve and coordinate testing of samples at the Michigan Department of Community Health, following established protocols.

Information for Healthcare Providers:

- MDCH Ricin Fact Sheet
http://www.michigan.gov/documents/Ricinfactsforthepublic_55144_7.pdf
- NIOSH Emergency Response Card
<http://www.bt.cdc.gov/agent/ricin/erc9009-86-3pr.asp>
- US Army Office of the Surgeon General. Ricin. <http://www.nbc-med.org/SiteContent/HomePage/WhatsNew/MedAspects/Ch-32electrv699.pdf>
- US Army Medical Research Institute of Infectious Diseases. Medical Management of Biological Casualties Handbook. Fourth Edition, February 2001.
<http://www.usamriid.army.mil/education/bluebook.html> see p. 70.